

### **Amendments to the Claims:**

Re-write the claims as set forth below: This listing of claims will replace all prior versions and listings, of claims in the application.

### **Listing of Claims:**

1. – 4. (Canceled)

5. (Currently amended) The method according to claim 22, wherein ~~in the step of~~ finding at least a portion of the primitive that is inside the primitive, given a start point  $X=XSTART$  and  $Y=YSTART$  for the primitive, the method further comprises ~~the steps of:~~

(1) incrementing Y if a first value,  $((YDIR \text{ AND } (Y > YBOTTOM)) \text{ OR } ((\overline{YDIR} \text{ AND } (Y < YTOP))))$ , is logically true;

(2) incrementing X if a second value,  $((XDIR \text{ AND } (X > XRIGHT)) \text{ OR } ((\overline{XDIR} \text{ AND } (X < XLEFT))))$ , is logically true; and

(3) repeating steps (1) and (2) until the first and second values are not true, which identifies a beginning of a portion of the primitive that is inside of the screen region.

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Previously presented) The method according to claim 22, wherein the primitive is a triangle.

10. (Canceled)

11. (Previously presented) The system according to claim 23, wherein the system processes each primitive of a plurality of primitives.

12. (Canceled)

13. (Canceled)

14. (Currently amended) The method according to claim 23, wherein the edge walker module finds at least a portion of the primitive that is inside the primitive, given a start point  $X=XSTART$  and  $Y=YSTART$  for the primitive, by:

(1) incrementing Y if a first value,  $((YDIR \text{ AND } (Y > YBOTTOM)) \text{ OR } ((\overline{YDIR}) \text{ AND } (Y < YTOP)))$ , is logically true;

(2) incrementing X if a second value,  $((XDIR \text{ AND } (X > XRIGHT)) \text{ OR } ((\overline{XDIR}) \text{ AND } (X < XLEFT)))$ , is logically true; and

(3) repeating (1) and (2) until the first and second values are not true, which identifies a beginning of a portion of the primitive that is inside of the screen region.

15. (Currently amended) The system according to claim 23, wherein the span walker has filled all pixels in the portion of the primitive inside of the screen region when one of the following is true:

$(XDIR \text{ AND } (X < XLEFT)),$   
 $(\overline{XDIR} \text{ AND } (X > XRIGHT)),$   
 $(YDIR \text{ AND } (Y < YTOP)),$   
 $(\overline{YDIR} \text{ AND } (Y > YBOTTOM)).$

16. (Canceled)
17. (Previously presented) The method according to claim 23, wherein the primitive is a triangle.
18. (Currently amended) A graphic primitive clipping system that clips triangular primitives relative to a predetermined screen region, each primitive defined by location values XSTART, YSTART, XEND, and YEND[[],];  
XSTART and XEND defining an X direction extent and location of the primitive in the coordinate system, and ~~YSTART~~YTOP and ~~YEND~~YBOTTOM defining a Y direction extent and location of the primitive in the coordinate system, a screen region defined by limit values XLEFT, XRIGHT, YTOP, and YBOTTOM[[],];  
XLEFT and XRIGHT defining an X direction extent and location of the screen region in the coordinate system, and YSTART and YEND defining a Y direction extent and location of the screen region in the coordinate system, the primitive further defined by first and second x direction values of 0 and 1, respectively, for an x direction XDIR in the coordinate system as, respectively, left to right and right to left relative to the screen region, and first and second y

direction values as 0 and 1, respectively, for a y direction YDIR in the coordinate system as, respectively, top to bottom and bottom to top, comprising:

a primitive locator module having an input for receiving primitives and having an output for supplying only primitives that are at least partially within the screen region, primitives being totally outside the screen area if at least one of the following is logically true given a start point  $X=XSTART$  and  $Y=YSTART$  for a primitive:

$$XDIR \text{ AND } ((X < XLEFT) \text{ OR } (XEND > XRIGHT))$$

$$\overline{XDIR} \text{ AND } ((X > XRIGHT) \text{ OR } (XEND < XLEFT))$$

$$YDIR \text{ AND } ((Y < YTOP) \text{ OR } (YEND > YBOTTOM))$$

$$\overline{YDIR} \text{ AND } ((Y > YBOTTOM) \text{ OR } (YEND < YTOP));$$

an edge walker module having an input operatively connected to the output of the primitive locator module and having an output for supplying data identifying the portion of the primitive inside of the primitive, the edge walker module structured such that at least a portion of the primitive that is inside the primitive, given a start point  $X=XSTART$  and  $Y=YSTART$  for the primitive, being found by:

(1) incrementing Y if a first value,  $((YDIR \text{ AND } (Y > YBOTTOM)) \text{ OR } ((\overline{YDIR}) \text{ AND } (Y < YTOP)))$ , is logically true;

(2) incrementing X if a second value,  $((XDIR \text{ AND } (X > XRIGHT)) \text{ OR } ((\overline{XDIR}) \text{ AND } (X < XLEFT)))$ , is logically true; and

(3) repeating steps (1) and (2) until the first and second values are not true, which identifies a beginning of a portion of the primitive that is inside of the screen region; and

a span walker having an input operatively connected to the output of the edge walker and an output for supplying filled pixels for pixels in the portion of the primitive inside of

the screen region, the span walker having filled all pixels in the portion of the primitive inside of the screen region when one of the following is true:

$(XDIR \text{ AND } (X < XLEFT)),$

$(\overline{XDIR} \text{ AND } (X > XRIGHT)),$

$(YDIR \text{ AND } (Y < YTOP)),$

$(\overline{YDIR} \text{ AND } (Y > YBOTTOM)).$

19. (Previously presented) The system according to claim 18, wherein the start point is a vertex of the primitive.

20. (Canceled)

21. (Canceled)

22. (Currently amended) In a computer system, a method for rasterizing primitives, comprising the steps of:

determining if a primitive is totally outside a predetermined screen region or at least partially within the predetermined screen region;

discarding the primitive if the primitive is totally outside the screen region;

finding a portion of the primitive that is inside the screen region if the primitive is not totally outside the screen region;

filling only pixels in the portion of the primitive that is inside the screen region.

wherein ~~the step of~~ determining if the primitive is inside or outside of the screen region, comprises ~~the steps of~~:

providing an X, Y coordinate system;

determining values of XSTART, YSTART, XEND, and YEND for the primitive, XSTART and XEND defining an X direction extent and location of the primitive in the coordinate system, and YSTART and YEND defining a Y direction extent and location of the primitive in the coordinate system;

providing values of XLEFT, XRIGHT, YTOP, and YBOTTOM for the screen region, XLEFT and XRIGHT defining an X direction extent and location of the screen region in the coordinate system, and ~~YSTART~~YTOP and ~~YEND~~YBOTTOM defining a Y direction extent and location of the screen region in the coordinate system;

comparing the primitive values to the screen region values to determine if the primitive is totally outside the screen region;

defining first and second x direction values of 0 and 1, respectively, for an x direction XDIR in the coordinate system as, respectively, left to right and right to left relative to the screen region, and defining first and second y direction values as 0 and 1, respectively, for a y direction YDIR in the coordinate system as, respectively, top to bottom and bottom to top; and

determining that the primitive is totally outside the screen area if at least one of the following is logically true given a start point X=XSTART and Y=YSTART for the primitive:

$XDIR \text{ AND } ((X < XLEFT) \text{ OR } (XEND > XRIGHT))$

$\overline{XDIR} \text{ AND } ((X > XRIGHT) \text{ OR } (XEND < XLEFT))$

$YDIR \text{ AND } ((Y < YTOP) \text{ OR } (YEND > YBOTTOM))$

$\overline{YDIR} \text{ AND } ((Y > YBOTTOM) \text{ OR } (YEND < YTOP)); \text{ and}$

wherein in ~~the step of filling~~ the filling is finished when one of the following is true:

$(XDIR \text{ AND } (X < XLEFT)),$

$(\overline{XDIR} \text{ AND } (X > XRIGHT)),$

$(YDIR \text{ AND } (Y < YTOP)),$

$(\overline{YDIR} \text{ AND } (Y > YBOTTOM)).$

23. (Currently amended) A graphic primitive clipping system that receives primitives and clips the primitives relative to a predetermined screen region, comprising:

a setup engine having an input for receiving a primitive and an output for supplying at least location values of the primitive relative to the screen region;

a primitive locator module having an input operatively connected to the output of the setup engine and having an output for supplying the at least location values only of primitives that are partially within the screen region;

an edge walker module having an input operatively connected to the output of the primitive locator module and having an output for supplying data identifying the portion of the primitive inside of the screen region;

a span walker having an input operatively connected to the output of the edge walker and an output for supplying filled pixels for pixels in the portion of the primitive inside of the screen region;

wherein the primitive locator module compares the location values of the primitive to starting and ending values of the screen region values to determine if the primitive is totally outside the screen region;

wherein the primitive and the screen region lie in an X,Y coordinate system, wherein the location values of the primitive are XSTART, YSTART, XEND, and YEND[[,]];:

XSTART and XEND defining an X direction extent and location of the primitive in the coordinate system, and YSTART and YEND defining a Y direction extent and location of the primitive in the coordinate system, and wherein the screen region has limit values of XLEFT, XRIGHT, YTOP, and YBOTTOM[[,]];:

XLEFT and XRIGHT defining an X direction extent and location of the screen region in the coordinate system, and ~~YSTART~~YTOP and ~~YEND~~YBOTTOM defining a Y direction extent and location of the screen region in the coordinate system, wherein the primitive further is defined by first and second x direction values of 0 and 1, respectively, for an x direction XDIR in the coordinate system as, respectively, left to right and right to left relative to the screen region, and first and second y direction values as 0 and 1, respectively, for a y direction YDIR in the coordinate system as, respectively, top to bottom and bottom to top, and wherein the primitive is totally outside the screen area if at least one of the following is logically true given a start point X=XSTART and Y=YSTART for the primitive:

$$XDIR \text{ AND } ((X < XLEFT) \text{ OR } (XEND > XRIGHT))$$

$$\overline{XDIR} \text{ AND } ((X > XRIGHT) \text{ OR } (XEND > XLEFT))$$

$$YDIR \text{ AND } ((Y < YTOP) \text{ OR } (YEND > YBOTTOM))$$

$$\overline{YDIR} \text{ AND } ((Y > YBOTTOM) \text{ OR } (YEND < YTOP)).$$